Alg. 2 Warm Up # 8-5

Solve. (all answers exact and simplified)

1. $0 = x^2 + 6x - 11$

2. $2x^2 + 4x = 7$

3. $4(x - 5)^2 + 12 = 0$

4. $3x^2 - 2x + 1 = 0$

Week 8 Classwork:

Warm up

CP's: 7- # 33, 34

CP's: 7- # 45 ---> 49

Salmon - quiz practice (Optional for Juniors gone for testing)

CP's: 8- # 63 ---> 67

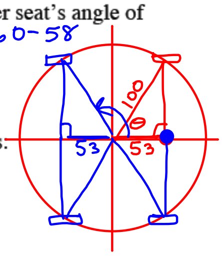
CP's: 7- # 50 ---> 52
(pink)

HW Questions: #62 - 70

7-62. Shinna was riding *The Screamer* when it broke down. Her seat was 53 horizontal feet from the central support pole. What was her seat's angle of rotation? How can you tell?

$\cos\theta = \frac{53}{100}$ $\theta = \cos^{-1}\left(\frac{53}{100}\right)$ $180-58$ $180+58$ $360-58$

$\theta \approx 58^\circ, 122^\circ, 238^\circ, 302^\circ$



7-63. Sketch a unit circle. In your circle, sketch in an angle that has:

a. A positive cosine and a negative sine. → x → h or y

b. A sine of −1.

c. A negative cosine and a negative sine.

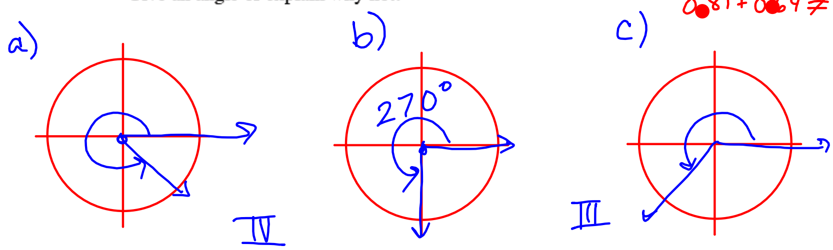
d. A cosine of about −0.9 and a sine of about 0.4.

e. Could an angle have a sine equal to 0.9 and cosine equal to 0.8? Give an angle or explain why not.

$\sin^2\theta + \cos^2\theta = 1$

$(0.9)^2 + (0.8)^2 \stackrel{?}{=} 1$

$0.81 + 0.64 \neq 1$

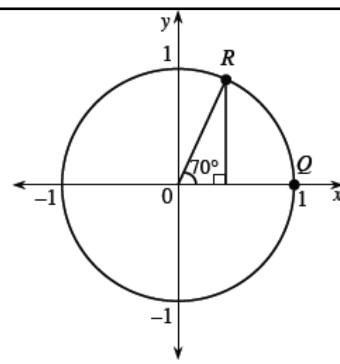


7-64. A 70° angle is drawn for you in the unit circle at right.

a. Approximate the coordinates of point *R*.

b. How could you represent the *exact* coordinates of point *R*?

c. Show that the Pythagorean Identity works for this angle.

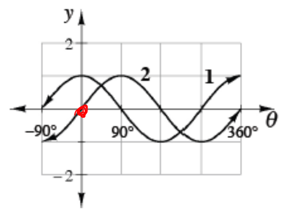


$\sin^2\theta + \cos^2\theta = 1$?

$(\sin 70^\circ)^2 + (\cos 70^\circ)^2 \stackrel{?}{=} 1$

7-65. Daniel sketched the graphs at right for $y = \sin\theta$ and $y = \cos\theta$.

Unfortunately, he forgot to label the graphs, and now he cannot remember which graph goes with which equation. Explain to Daniel how he can tell (and remember!) which graph is $y = \sin\theta$ and which is $y = \cos\theta$.



7-66. Consider the system of equations $y = \cos x$ and $y = -1$.

a. Is it possible to solve this system by substitution? By the Elimination Method? By graphing?

b. List at least five possible solutions. $x = 180°, 540°, 900°,$

c. Consider the list of solutions you wrote in part (b) as a sequence and write an equation to represent *all* possible solutions.

n	1	2	3
$t(n)$	$180°$	$540°$	$900°$

$-360°$ $\quad +360°$ $\quad +360$

$t(n) = -180 + 360n$

7-67. This problem is a checkpoint for finding the x- and y-intercepts of a quadratic function. It will be referred to as Checkpoint 7A.

Find the x- and y-intercepts for the graph of $y = x^2 + 4x - 17$ without using a graphing calculator.

7-68. Solve each equation.

a. $\frac{3}{x+1}=\frac{4}{x}$

b. $\frac{3}{x+1}+\frac{4}{x}=2$

c. $\frac{3}{x+2}+5=\frac{3}{x+2}$

d. Explain why part (c) has no solution.

$$\frac{3}{x+1}=\frac{2x}{1x}-\frac{4}{x}$$

$$\frac{3}{(x+1)}=\frac{(2x-4)}{x}$$

Now cross multiply...

OR b) Multiply both sides by LCD

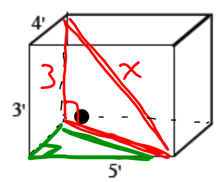
$LCD = x(x+1) \rightarrow \quad x(x+1)\left(\frac{3}{x+1}+\frac{4}{x}\right)=2x(x+1)$

$$3x+4(x+1)=2x^2+2x$$

7-69. A $5'\times 4'\times 3'$ box is made for the purpose of storage. What is the longest pole that can fit inside the box?

$4^2+5^2=y^2$

$\sqrt{41}=y$



7-70. While working on their homework on sequences, Davis was suddenly stumped!

"This problem doesn't make sense!" he exclaimed. Tess was working on her homework as well.

"What's the problem?" she asked.

"This problem is about a SEQUENCE, $t(n)=9n-2$, but it is asking whether or not it is a function. How can a sequence be a function?"

"Well of course a sequence is a function!" said Tess.

Who is right? Should Davis be confused, or is Tess correct? What is the difference between a sequence and a function? Explain completely.

CP's: 7- # 71 ---> 76 (Blue WS)

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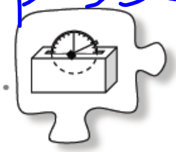
7.1.5 How else can I measure angles?



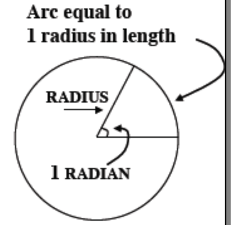
Defining a Radian

Whose idea was it to measure angles in degrees? And why are there 360° in a full turn? This decision actually dates back almost 4000 years! Degrees were created by the Babylonians, an ancient people who lived in the region that is now Iraq. The Babylonians also based their number system, called a sexigesimal system, on sixty.

Although you are familiar with measuring angles in degrees, this is not the only way to measure angles, nor is it necessarily the most useful. Today you will learn a different unit for measuring angles called a **radian**. Using radians instead of degrees is actually the standard across mathematics! When you take calculus, you will learn why radians are used in math more often than degrees.

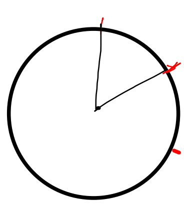
7-71. What word are you reminded of when you hear the word radian? Discuss this with your team and make a conjecture about how this might relate to a way to measure angles. Be prepared to share your ideas with the class.

7-72. HOW TO MAKE A RADIAN

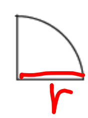


Imagine wrapping the radius of a circle around the circle. The angle formed at the center of the circle that corresponds to the arc that is one radius long has a measure of exactly one **radian**.

Your teacher will provide each member of your team with a different-sized circular object and some scissors.



a. ~~Trace your circular object onto a sheet of paper and carefully cut out the circle~~. Fold the paper circle in half and then in half again so that it is in the shape of a quarter circle, as in the diagram at right. How can you see the radius of your circular object in this new folded shape?



b. ~~Place your circular object onto another sheet of paper and trace it again, only this time leave the circular object in place~~. Roll (or wrap) a straight edge of your folded circle around your circular object and mark one radius length on the traced circle. Then mark another radius length that begins where the first one ended. Continue marking radius lengths until you have gone around the entire circle.

c. ~~Remove the circular object from your paper~~. On your traced circle, connect each radius mark to the center, creating central angles. Each angle you see, formed by an arc with a length of one radius, measures one **radian**. Label each of the radius lengths and each angle that measures one full radian. Write a short description of how you constructed an angle with measure one radian.

7-73. Assume the radius of a circle is one unit.

a. What is the area of the circle? What is its circumference?

b. How many radii would it take to wrap completely around the circle? Express your answer as a decimal approximation *and* as an exact value.

c. Does the size of the circle matter? That is, does the number of radii it takes to wrap around the circle change as the radius of the circle gets larger or smaller? Why does this make sense?

d. Exactly how many radians are in 360°? In 90°?

a) $A = \pi r^2$

$A = \pi(1)^2$

$A \approx 3.14$

$C = 2\pi r$

$= 2\pi(1)$

$C \approx 6.28$

7-74. LEARNING LOG

How is a radian related to a radius? Explain your understanding of this relationship in your Learning Log. Use diagrams to support your explanation. Title this entry "Radians" and label it with today's date.

7-75. Parts (a) through (g) below describe angles. Draw each angle on its own unit circle.

a. 1 degree b. 1 radian c. π radians d. $\frac{\pi}{2}$ radians

e. $\frac{\pi}{4}$ radians f. $\frac{\pi}{3}$ radians g. $\frac{\pi}{6}$ radians

7-76. Find your sine-calculator (the Lesson 7.1.3 Resource Page). Use your new understanding of radians to convert the units on the θ axis from degrees to radians. Be prepared to share your conversion strategies with the class.

HW: 7-

77 ---> 85